UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/973,792	10/11/2001	Efraim Berkovich	902.000/10108288	7240

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ART UNIT	PAPER NUMBER
2133	

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Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 May 2002*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 October 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application)
since a specific reference was included in the first sentence of the specification or in an Application Data Sheet.
37 CFR 1.78.

    a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific
reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *2* .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: .

DETAILED ACTION

Drawings

1.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5)

because they include the following reference sign(s) not mentioned in the description:

'501', '503', '507', '508' & '509' in Figures 5A-5E; '908' & '910' in Figure 9; and '1403' &

'1405' in Figure 14. A proposed drawing correction, corrected drawings, or amendment

to the specification to add the reference sign(s) in the description, are required in reply

to the Office action to avoid abandonment of the application. The objection to the

drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because

reference character "505" has been used to designate both the area outside the circle of

radius C in Figure 5A and the area inside the circle of radius C in Figure 5B. A

proposed drawing correction or corrected drawings are required in reply to the Office

action to avoid abandonment of the application. The objection to the drawings will not

be held in abeyance.

Specification

        Applicant is reminded of the proper language and format for an abstract of the
disclosure.

        The abstract should be in narrative form and generally limited to a single
paragraph on a separate sheet **within the range of 50 to 150 words. It is important
that the abstract not exceed 150 words in length since the space provided for the**

abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because the abstract exceeds 150 words and because 'pairwise' in line 3 should be –pair wise--, that is, 'pair wise' is two words. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2.   Claims 1-7, 13 and 15-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 1 recites, "inverse fault-tolerant decoder". Nowhere in the specification does the Applicant teach what an "inverse fault-tolerant decoder" is nor does the Applicant teach how an "inverse fault-tolerant decoder" distinguishes itself from any other error-correction decoder. Paragraph [0097] on page 32 of the Applicant's specification teaches that a Golay [23,12,7] code is an example of an

inverse error correction code hence the Examiner assumes that a decoder for decoding

a Golay [23,12,7] code is an example of an "inverse fault-tolerant decoder".

Claims 2-7 depend from claim 1, hence inherit the deficiencies of claim 1.

Claims 13 and 15, recite the term "inverse fault-tolerant decoder" as in claim 1.

Claims 16-20 depend from claim 15, hence inherit the deficiencies of claim 15.

Claims 3 and 4 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with

the enablement requirement. The claim(s) contains subject matter which was not

described in the specification in such a way as to enable one skilled in the art to which it

pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 3 recites, "a reverse perfect error correction code". Nowhere in the specification

does the Applicant teach what a "reverse perfect error correction code" is nor does the

Applicant teach how a "reverse perfect error correction code" distinguishes itself from

any other error-correction code. Claim 3 recites, "a reverse Golay code". Nowhere in

the specification does the Applicant teach what a "reverse Golay code" is nor does the

Applicant teach how a "reverse Golay code" distinguishes itself from any other Golay

code.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly
claiming the subject matter which the applicant regards as his invention.

Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

Claim 1 recites the limitation "said index value" in line 4. There is insufficient

antecedent basis for this limitation in the claim.

Claims 2-7 depend from claim 1, hence inherit the deficiencies of claim 1.

Claims 8 and 15 recite the term "said index value" as in claim 1.

Claims 9-14 depend from claim 8, hence inherit the deficiencies of claim 8.

Claims 16-20 depend from claim 15, hence inherit the deficiencies of claim 15.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3.   Claims 1-5 and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Berkovich et al. (Berkovich, S., El-Qawasmeh, E., "Reversing the Error-Correction

Scheme for a Fault-Tolerant Indexing, " The Computer Journal, vol. 43, no. 1, pp. 54 -

64, January 2000).

35 U.S.C. 103(a) rejection of claims 1 and 15.

Berkovich teaches a data dictionary comprising: an inverse fault-tolerant decoder

implemented for an error-correction code (col. 2 on page 6 of Berkovich teaches a

Golay [23,12,7] code; Note: paragraph [0097] on page 32 of the Applicant's

specification teaches that a Golay [23,12,7] code is an example of an inverse error

correction code hence a decoder for decoding a Golay [23,12,7] code is an inverse

fault-tolerant decoder) configured to transform a data vector into a plurality of

predetermined index values (col. 1 on page 6 of Berkovich teaches that a data vector

1001100 is transformed into 8 index values that are predetermined in the table of Figure

4 by adding the data vector 1001100 to all vectors of weight 1); a computational

arrangement to combine pairs of said index values to form corresponding, combined

hash indices (a computational arrangement in Figure 4 of Berkovich is used to combine

the 8 index values calculated by adding the data vector 1001100 to all vectors of weight

1 to form the 4 corresponding, combined hash indices 1011, 0001, 1000 and 1101); and

data storage configured as a hash table referencing indexed data corresponding to said

combined hash indices (col. 2 on page 13 of Berkovic teaches a hash table referencing

indexed data corresponding to said combined hash indices; Note: a hash table is a

storage means for referencing indexed data corresponding to said combined hash indices). Note: use of a computer readable medium for implementing the design taught in the Berkovich paper as claimed in claim 15 is an obvious engineering design choice based on design requirements associated with speed, availability of storage space, etc. However Berkovich does not explicitly teach the specific use of **combinational logic** configured to combine pairs of said index values to form corresponding.

The Examiner asserts that the operation of combining pairs of index values to form corresponding, combined hash indices is a binary operation hence it would be obvious to use combinational logic to combine pairs of said index values to form corresponding, combined hash indices based on obvious engineering design choices since that is what combinational logic is designed for.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Berkovich by including use of **combinational logic** configured to combine pairs of said index values to form corresponding. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of **combinational logic** configured to combine pairs of said index values to form corresponding would provide the opportunity to implement the method taught in the Berkovich paper based on obvious engineering design choices using combinational logic since that is what combinational logic is designed for.

35 U.S.C. 103(a) rejection of claims 2 and 16.

The data vector 1001100 in col. 1 on page 6 of Berkovich is a bit-attribute vector.

35 U.S.C. 103(a) rejection of claims 3, 4 and 17.

Col. 2 on page 6 of Berkovich teaches a Golay [23,12,7] code; Note: paragraph [0097] on page 32 of the Applicant's specification teaches that a Golay [23,12,7] code is an example of an inverse error correction code hence a decoder for decoding a Golay [23,12,7] code is an inverse fault-tolerant decoder.

35 U.S.C. 103(a) rejection of claims 5 and 18.

Each of the buckets of a Golay code of Hamming distance 2 comprise border vector types of hamming distance 2 located at a border of a decoding sphere and non-border vector types of Hamming distance less than 2 located interior to said decoding sphere.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4.   Claims 8- rejected under 35 U.S.C. 102(b) as being anticipated by Berkovich et al. (Berkovich, S., El-Qawasmeh, E., "Reversing the Error-Correction Scheme for a Fault-Tolerant Indexing, " The Computer Journal, vol. 43, no. 1, pp. 54 - 64, January 2000).

35 U.S.C. 102(b) rejection of claim 8.

Berkovich teaches a data dictionary comprising: an inverse fault-tolerant decoder

implemented for an error-correction code (col. 2 on page 6 of Berkovich teaches a

Golay [23,12,7] code; Note: paragraph [0097] on page 32 of the Applicant's

specification teaches that a Golay [23,12,7] code is an example of an inverse error

correction code hence a decoder for decoding a Golay [23,12,7] code is an inverse

fault-tolerant decoder) configured to transform a data vector into a plurality of

predetermined index values (col. 1 on page 6 of Berkovich teaches that a data vector

1001100 is transformed into 8 index values that are predetermined in the table of Figure

4 by adding the data vector 1001100 to all vectors of weight 1); a computational

arrangement to combine pairs of said index values to form corresponding, combined

hash indices (a computational arrangement in Figure 4 of Berkovich is used to combine

the 8 index values calculated by adding the data vector 1001100 to all vectors of weight

1 to form the 4 corresponding, combined hash indices 1011, 0001, 1000 and 1101); and

data storage configured as a hash table referencing indexed data corresponding to said

combined hash indices (col. 2 on page 13 of Berkovic teaches a hash table referencing

indexed data corresponding to said combined hash indices; Note: a hash table is a

storage means for referencing indexed data corresponding to said combined hash

indices).

35 U.S.C. 102(b) rejection of claim 9.

The data vector 1001100 in col. 1 on page 6 of Berkovich is a bit-attribute vector.

35 U.S.C. 102(b) rejection of claims 10 and 11.

Col. 2 on page 6 of Berkovich teaches a Golay [23,12,7] code; Note: paragraph [0097] on page 32 of the Applicant's specification teaches that a Golay [23,12,7] code is an example of an inverse error correction code hence a decoder for decoding a Golay [23,12,7] code is an inverse fault-tolerant decoder.

35 U.S.C. 102(b) rejection of claim 12.

Each of the buckets of a Golay code of Hamming distance 2 comprise border vector types of hamming distance 2 located at a border of a decoding sphere and non-border vector types of Hamming distance less than 2 located interior to said decoding sphere.

Conclusion

5.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Arnold, Richard F. et al. (US 4564944 A) teaches double-error correcting scheme and more specifically, with an error correcting scheme employing hashing functions and syndromes for error identification. Franaszek, Peter A. et al. (US 5522032 A) teaches hash table entry for a block in a parity cache. Dan, Asit et al. (US 5490248 A) teaches hash table mappings. Carter, John L. et al. (US 4538240 A) teaches a method and apparatus for performing a hashing operation on an N bit number
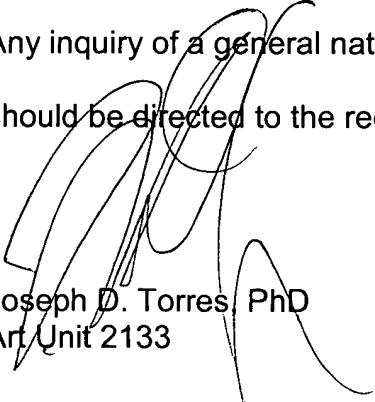
under control of a prespecified N bit <u>hashing</u> constant which comprises performing N/K

finite field partial multiplications.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Joseph D. Torres whose telephone number is (703)

308-7066. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Albert Decady can be reached on (703) 305-9595. The fax phone number

for the organization where this application or proceeding is assigned is (703) 746-7239.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is (703)-746-7240.

Joseph D. Torres, PhD
Art Unit 2133